

"QUIZ" for Lecture 2

NAME: (print!) Brianna Patnaude Section: 22

E-MAIL ADDRESS SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com
 (Attachment: q2FirstLast.pdf) ASAP BUT NO LATER THAN FRIDAY Sept. 11,
 8:00pm _____

1. Determine whether the two vectors are orthogonal and if not, whether the angle between them is acute or obtuse. a. $\langle 1, 1, 1 \rangle$, $\langle 3, -2, -1 \rangle$.

$$a) \langle 1, 1, 1 \rangle \cdot \langle 3, -2, -1 \rangle = (1)(3) + (1)(-2) + (1)(-1) = 3 - 2 - 1 = 0$$

b. $\langle 4, 3 \rangle$, $\langle 2, -4 \rangle$.

b) $A \cdot B = 0 \Rightarrow$ orthogonal vectors

$$\langle 4, 3 \rangle \cdot \langle 2, -4 \rangle = (4)(2) + (-4)(3) = 8 - 12 = -4$$

$$\cos \theta = \frac{A \cdot B}{|A||B|} = \frac{-4}{5 \times \sqrt{20}} = -0.179$$

$$\cos^{-1}(-0.179) = 100.3^\circ$$

$$\theta = 100.3^\circ$$

$$\cos \theta = \frac{A \cdot B}{|A||B|} = \frac{2}{\sqrt{3} \times \sqrt{14}} = 0.309$$

$$\cos^{-1}(0.309) = 72.02^\circ$$

$$\theta = 72.02^\circ$$

2. Calculate $v \times w$, if

$$v = \langle 0, 1, -1 \rangle \text{ , } w = \langle 1, -1, 0 \rangle .$$

$$v \times w = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & 1 & -1 \\ 1 & -1 & 0 \end{vmatrix} = -1\hat{i} - 0\hat{j} + (-1\hat{k})$$

$$v \times w = \langle -1, 0, -1 \rangle$$